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REMARKS

Applicants thank the Examiner for the second complete examination of the instant application. Claims 1-26 are currently pending in the instant application. Claims 20-26 have been added by way of this amendment, and dependent claim 5 has been amended to rectify a minor error therein. Claims 1 and 20 are independent. Reconsideration of this application, as amended, is respectfully requested.

Claim Rejection Under 35 U.S.C. § 112

Claim 6 stands rejected under 35 U.S.C. § 112, second paragraph, as failing to set forth subject matter which Applicants regard as the invention. This rejection is respectfully traversed.

Dependent claim 6 sets forth a "A continuous casting and rolling plant, with a computing unit and means for carrying out the method as claimed in claim 1." (Emphasis added.) Claim 6 further sets forth that "the computing unit contains a genetic algorithm for determining the order of the slabs belonging to the production orders within the sequences."

In rejecting the claim, the Examiner states that the language "slabs belonging to different production orders are produced within sequences on the continuous casting and rolling plant" is confusing. The Applicants fail to understand why this language is confusing, as it clearly describes an operational aspect of the continuous casting and rolling plant.

In addition, claim 6 properly depends from independent claim 1. That is, the subject matter of claim 6 is further limiting of that which is set forth in independent claim 1.

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In view of the above comments, Applicants respectfully request that the Examiner reconsider and withdraw the claim rejection under 35 U.S.C. §112, second paragraph.

Claim Rejection Under 35 U.S.C. §103

Claims 1-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lee et al. (U.S. Patent No. 5,808,891) in view of Shaefer, (U.S. Patent No. 5,222,192). This rejection is respectfully traversed.

In response to the Applicants' Amendment dated March 5, 2003, the Examiner has set forth various conclusionary statements in conjunction with case citations in an effort to traverse the Applicants arguments. However, the Applicants would like to remind the Examiner that conclusionary statements are not sufficient to support a proper *prima facie* case of obviousness under 35 U.S.C. §103(a). Instead, it is the Examiner's responsibility to rebut the Applicants' arguments with substantive reasoning. Applicants respectfully submit that the Examiner continues to fail to meet this burden. Nonetheless, the Applicants provide the following additional arguments for the Examiner's consideration.

1. Rejection fails test for establishing *prima facie* case of obviousness.

Applicants direct the Examiner's attention to two recent cases decided by the Court of Appeals for the Federal Circuit (CAFC), In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed.Cir. 1999) and In re Kotzab, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed.Cir. 2000). Both of these cases set forth very rigorous requirements for establishing a *prima facie* case of obviousness under 35 U.S.C. §103(a). To establish obviousness based on a combination of elements disclosed in the prior art, there must be some motivation,

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suggestion, or teaching of the desirability of making the specific combination that was made by the Applicants. The motivation suggestion or teaching may come explicitly from one of the following:

- (a) the statements in the prior art (patents themselves)
- (b) the knowledge of one of ordinary skill art, or in some cases,
- (c) the nature of the problem to be solved.

See Dembiczak 50 USPQ at 1614 (Fed.Cir. 1999). In Kotzab, the CAFC held that even though various elements of the claimed invention were present (in two separate embodiments of the same prior art reference), there was no motivation to combine the elements from the separate embodiments, based on the teachings in the prior art.

In order to establish a prima facie case of obviousness under 35 U.S.C. §103(a), the Examiner must provide particular findings as to why the two pieces of prior art are combinable. See Dembiczak 50 USPQ2d at 1617. Broad conclusory statements standing alone are not "evidence".

In order to provide motivation for combining Lee et al. and Shaefer to reject the claims, the Examiner asserts:

it would have been obvious to one of ordinary skill in the art at the time the invention was made to use genetic algorithms of Shaefer in the place of the optimization technique of Lee because genetic algorithms provide "extraordinary quick discovery of early proximate solutions" (Shaefer, Col. 3, lines 43-50).

Generally, the Lee et al. patent relates to a method for creating a rolling production schedule in a steel plant. According to the patent, such a schedule is determined by taking into account key operating strengths of individual facilities as well as those on which the facility of interest has dependencies. The schedule also addresses objectives such as maximizing throughput, maximizing on-time delivery, and maximizing operating costs. (See Col. 3, lines 32-36.) As the Examiner is undoubtedly aware, Lee et al. makes no mention of the use of

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genetic algorithms for assisting the scheduling of the steel plant. Therefore, a teaching or suggestion that genetic algorithms may be used in producing a schedule relating to a steel plant simply is not taught or suggested by the disclosure of the Lee et al. patent.

In order to make up for this deficiency of the Lee et al. patent, the Examiner has relied upon Shaefer. Shaefer teaches the use of a standard genetic algorithm optimizing (SGAO) for optimizing functions related to a population of chromosomes. The patent document also describes the use of an adaptive representation genetic optimizer technique (ARGOT) that may be used to find the best solution related to a number of chromosomes. In the ARGOT process, an enhanced process is used to examine the chromosomes in order to find and convert to a solution.

On one hand, the Examiner has relied upon Lee et al. to teach the idea of scheduling within a steel plant, and on the other hand, Shaefer to teach the use of genetic algorithms. However, because both the patent documents fail to teach or suggest the use of genetic algorithms in conjunction with continuous rolling and casting plants, Applicants continue to maintain the Examiner has failed to establish a proper *prima facie* case of obviousness under 35 U.S.C. 103(a), in view of Dembiczak and Kotzab.

2. Examiner using Impermissible Hindsight.

In addition to the above, the Examiner is using impermissible hindsight reconstruction to reject the claims. The Examiner has used the present application as a blueprint, selected a prior art method relating to production plants, and then searched other prior art for the missing elements without identifying or discussing *any specific evidence of motivation to combine*, other than providing conclusory statements regarding the knowledge in the art,

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motivation and obviousness. The Federal Circuit has noted that the PTO and the courts "cannot use hindsight reconstruction to *pick and choose among isolated disclosures in the prior art to deprecate the claimed invention*," In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1780, 1783 (Fed. Cir. 1988), and that the best defense against hindsight-based obviousness analysis is the rigorous application of the requirement for a showing of a teaching or motivation to combine the prior art references. Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight. Dembiczak, 50 USPQ2d at 1617. For this reason also, the Applicants respectfully submit that the claims are allowable for at least this additional reason.

3. Examiner has not provided requisite motivation to combine

The Examiner has not provided the requisite evidence to support his allegation that there is motivation to combine Lee et al. and Shaefer, so as to render obvious that which Applicants have described. The essential factual evidence on the issue of obviousness is set forth in Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966) and extensive ensuing precedent. The patent examination process centers on prior art and the analysis thereof. When patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. See, e.g., McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) ("the central question is whether there is reason to combine [the] references," a question of fact drawing on the Graham factors).

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The Examiner has not provided the requisite showing of a suggestion, teaching, or motivation to combine the prior art references to reject the claims in the present application. "The factual inquiry whether to combine references must be thorough and searching." *Id.* It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with. See, e.g., Brown & Williamson Tobacco Corp. v. Philip Morris Inc., 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000) ("a showing of a suggestion, teaching, or motivation to combine the prior art references is an 'essential component of an obviousness holding'") (quoting C.R. Bard, Inc. v. M3 Systems, Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998)); In re Dembiczak, 50 USPQ2d at 1617 ("Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."); In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998) (there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant); In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988) ("teachings of references can be combined only if there is some suggestion or incentive to do so.") (emphasis in original) (quoting ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)).

The Examiner must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious."); In re Fritch, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (the examiner can satisfy the burden of showing obviousness of the combination "only by showing some objective teaching in the prior art or that knowledge generally available to one

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of ordinary skill in the art would lead that individual to combine the relevant teachings of the references").

Accordingly, the Examiner has not adequately supported the selection and combination of Lee et al. and Shaefer to render obvious that which Applicants have described. The Examiner's conclusory statement genetic algorithms provide "extraordinary quick discovery of early proximate solutions" does not adequately address the issue of motivation to combine. This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher." W.L. Gore v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). The Examiner must explain the reasoning behind his findings of motivation. Simply stating that combining Lee et al. and Shaefer, because genetic algorithms provide "extraordinary quick discovery of early proximate solutions" is an insufficient explanation for the combination.

Further, the Examiner is reminded that deferential judicial review under the Administrative Procedure Act does not relieve the agency (in this case the USPTO) of its obligation to develop an evidentiary basis for its findings. To the contrary, the Administrative Procedure Act reinforces this obligation. See, e.g., Motor Vehicle Manufacturers Ass'n v. State Farm Mutual Automobile Ins. Co., 463 U.S. 29, 43 (1983) ("the agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'") (quoting Burlington Truck Lines v. United States, 371 U.S. 156, 168 (1962)). In this respect, since the Examiner has not provided the requisite suggestion in the references to make his alleged

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combination, the Examiner rejects the precedent in In re Sung Lee, 23 USPO2d 1780 (Fed. Cir. 2002).

In its decision on Lee's patent application, the Board rejected the need for "any specific hint or suggestion in a particular reference" to support the combination of the Nortrup and Thunderchopper references. Omission of a relevant factor required by precedent is both legal error and arbitrary agency action. See Motor Vehicle Manufacturers, 463 U.S. at 43 ("an agency rule would be arbitrary and capricious if the agency . . . entirely failed to consider an important aspect of the problem"); Mullins v. Department of Energy, 50 F.3d 990, 992 (Fed. Cir. 1995) ("It is well established that agencies have a duty to provide reviewing courts with a sufficient explanation for their decisions so that those decisions may be judged against the relevant statutory standards, and that failure to provide such an explanation is grounds for striking down the action."). As discussed in National Labor Relations Bd. v. Ashkenazy Property Mgt. Corp., 817 F.2d 74, 75 (9th Cir. 1987), an agency is "not free to refuse to follow circuit precedent." Applicants submit that the Examiner has failed to provide a specific hint or suggestion in any of Lee et al. and Shaefer to support the alleged combination. In light of the weight of the above precedent, and in addition to the reasons in 1. and 2. above, Applicants respectfully submit that that the claims of the instant application are allowable.

4. Further Points

The Applicants remain dissuaded by the Examiner's provided motivation that one of ordinary skill in the art would have looked to the teachings of Shaefer in order to attempt to optimize the production schedule at a steel plant. If this were the case, why is it that Lee et al.

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did not look to the use of genetic algorithms, which were in the public purview at least three years before the filing of their patent application, as a manner by which a production scheduled a steel plant may be optimized? And if it is so obvious as the Examiner asserts, why is it that a patent document may not be found that asserts that the use of genetic algorithms is of a particular use in industrial applications?

The Applicants believe that the answer is simple. In particular, before the discovery of the present invention, it was simply not realized nor appreciated that the use of genetic algorithms in producing an optimized schedule in a continuous casting rolling plant may be achieved using the use of genetic algorithms. If such were the case, than the Examiner would be able to discover through simple search and investigation that genetic algorithms may be useful in conjunction with industrial applications, at the time of the discovery of the present invention..

In view of the comments hereinabove, Applicants respectfully request reconsideration and withdrawal of the claim rejection under 35 U.S.C. §103(a).

ADDITIONAL CLAIMS

Additional claims 20-26 are added hereby for the Examiner's consideration. These claims are allowable over the art relied upon by the Examiner for at least the reasons discussed herein.

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CONCLUSION

Accordingly, in view of the above amendments and remarks, reconsideration of the objections and rejections and allowance of each of claims in connection with the present application are earnestly solicited.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicants hereby petition for a two (2) month extension of time for filing a reply to the outstanding Office Action and submit the required \$410.00 extension fee herewith.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Timothy R. Wyckoff, Reg. No. 46,175 at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY & PIERCE, P.L.C.

By:


Donald J. Daley, Reg. No. 34,313

P.O. Box 8910
Reston, Virginia 20195
(703) 668-8000

DJD/TRW/cng

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